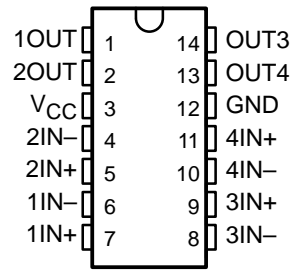


# LM139, LM139A, LM239, LM239A, LM339, LM339A, LM2901 QUAD DIFFERENTIAL COMPARATORS

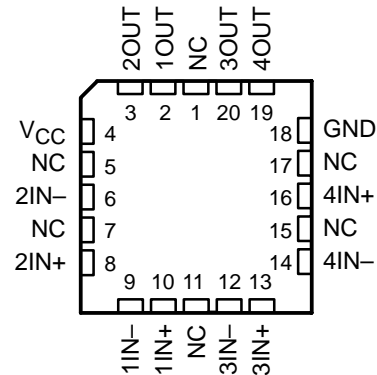
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- Single Supply or Dual Supplies
- Wide Range of Supply Voltage . . . 2 V to 36 V
- Low Supply-Current Drain Independent of Supply Voltage . . . 0.8 mA Typ
- Low Input Bias Current . . . 25 nA Typ
- Low Input Offset Current . . . 3 nA Typ (LM139)
- Low Input Offset Voltage . . . 2 mV Typ
- Common-Mode Input Voltage Range Includes Ground
- Differential Input Voltage Range Equal to Maximum-Rated Supply Voltage . . .  $\pm 36$  V
- Low Output Saturation Voltage
- Output Compatible With TTL, MOS, and CMOS
- Package Options Include Plastic Small-Outline (D, NS), Shrink Small-Outline (DB), Thin Shrink Small-Outline (PW), and Ceramic Dual Flatpack (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) DIPs

D, DB, J, N, NS, PW, OR W PACKAGE  
(TOP VIEW)



FK PACKAGE  
(TOP VIEW)



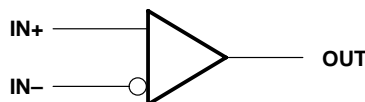
NC – No internal connection

## description

These devices consist of four independent voltage comparators that are designed to operate from a single power supply over a wide range of voltages. Operation from dual supplies also is possible as long as the difference between the two supplies is 2 V to 36 V and  $V_{CC}$  is at least 1.5 V more positive than the input common-mode voltage. Current drain is independent of the supply voltage. The outputs can be connected to other open-collector outputs to achieve wired-AND relationships.

The LM139 and LM139A are characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The LM239 and LM239A are characterized for operation from  $-25^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The LM339 and LM339A are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ . The LM2901 is characterized for operation from  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ .

## symbol (each comparator)



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS  
INSTRUMENTS**

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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

# LM139, LM139A, LM239, LM239A, LM339, LM339A, LM2901 QUAD DIFFERENTIAL COMPARATORS

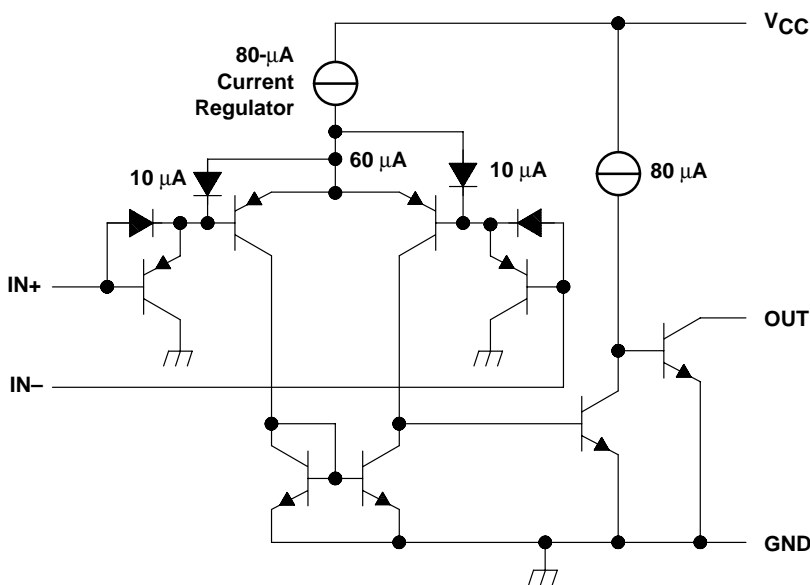
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## AVAILABLE OPTIONS

T <sub>A</sub>	V <sub>IO(max)</sub> at 25°C	PACKAGED DEVICES						
		PLASTIC SOIC (D, NS)	PLASTIC SSOP (DB)	CERAMIC CHIP CARRIER (FK)	CERAMIC DIP (J)	PLASTIC DIP (N)	PLASTIC TSSOP (PW)	CERAMIC DUAL FLATPACK (W)
0°C to 70°C	5 mV 5 mV 2 mV 2 mV	LM339D LM339NS LM339AD LM339ANS	LM339DBR — — —	— — — —	— — — —	LM339N — LM339AN —	LM339PWR — — —	— — — —
-25°C to 85°C	5 mV 2 mV	LM239D LM239AD	— —	— —	— —	LM239N LM239AN	— —	— —
-40°C to 125°C	7 mV 7 mV	LM2901D LM2901NS	LM2901DBR	—	—	LM2901N	LM2901PWR	—
-55°C to 125°C	5 mV 2 mV	LM139D LM139AD	—	LM139FK LM139AFK	LM139J LM139AJ	—	—	LM139W LM139AW

The D and NS packages are available taped and reeled. Add the suffix R to the device type (e.g., LM339DR). The DB and PW packages are only available taped and reeled.

## schematic (each comparator)



All current values shown are nominal.

**LM139, LM139A, LM239, LM239A,  
LM339, LM339A, LM2901**  
**QUAD DIFFERENTIAL COMPARATORS**  
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**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†**

Supply voltage, $V_{CC}$ (see Note 1)	36 V
Differential input voltage, $V_{ID}$ (see Note 2)	$\pm 36$ V
Input voltage range, $V_I$ (either input)	–0.3 V to 36 V
Output voltage, $V_O$	36 V
Output current, $I_O$	20 mA
Duration of output short circuit to ground (see Note 3)	Unlimited
Package thermal impedance, $\theta_{JA}$ (see Note 4): D package	86°C/W
DB package	96°C/W
N package	80°C/W
NS package	76°C/W
PW package	113°C/W
Continuous total dissipation	See Dissipation Rating Table
Case temperature for 60 seconds: FK package	260°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D, DB, N, or PW package	260°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: J package	300°C
Storage temperature range, $T_{stg}$	–65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES:
1. All voltage values, except differential voltages, are with respect to network ground.
  2. Differential voltages are at  $IN+$  with respect to  $IN-$ .
  3. Short circuits from outputs to  $V_{CC}$  can cause excessive heating and eventual destruction.
  4. The package thermal impedance is calculated in accordance with JESD 51-7.

**DISSIPATION RATING TABLE**

PACKAGE	$T_A \leq 25^\circ\text{C}$ POWER RATING	DERATING FACTOR	DERATE ABOVE $T_A$	$T_A = 70^\circ\text{C}$ POWER RATING	$T_A = 85^\circ\text{C}$ POWER RATING	$T_A = 125^\circ\text{C}$ POWER RATING
FK	900 mW	11 mW/°C	68°C	880 mW	715 mW	275 mW
J	900 mW	11 mW/°C	68°C	880 mW	715 mW	275 mW



**LM139, LM139A, LM239, LM239A,  
LM339, LM339A, LM2901  
QUAD DIFFERENTIAL COMPARATORS**

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**electrical characteristics at specified free-air temperature,  $V_{CC} = 5\text{ V}$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS†	$T_A$ ‡	LM139			LM139A			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
$V_{IO}$ Input offset voltage	$V_{CC} = 5\text{ V to }30\text{ V},$ $V_{IC} = V_{ICR}(\text{min}),$ $V_O = 1.4\text{ V}$	25°C		2	5		1	2	mV
		Full range			9			4	
$I_{IO}$ Input offset current	$V_O = 1.4\text{ V}$	25°C		3	25		3	25	nA
		Full range			100			100	
$I_{IB}$ Input bias current	$V_O = 1.4\text{ V}$	25°C		-25	-100		-25	-100	nA
		Full range			-300			-300	
$V_{ICR}$ Common-mode input-voltage range		25°C		0 to $V_{CC}-1.5$			0 to $V_{CC}-1.5$		V
		Full range		0 to $V_{CC}-2$			0 to $V_{CC}-2$		
$A_{VD}$ Large-signal differential-voltage amplification	$V_{CC} \pm = \pm 7.5\text{ V},$ $V_O = -5\text{ V to }5\text{ V}$	25°C		200		50	200	V/mV	
$I_{OH}$ High-level output current	$V_{ID} = 1\text{ V}$	$V_{OH} = 5\text{ V}$	25°C		0.1		0.1	nA	
		$V_{OH} = 30\text{ V}$	Full range		1		1	$\mu\text{A}$	
$V_{OL}$ Low-level output voltage	$V_{ID} = -1\text{ V},$ $I_{OL} = 4\text{ mA}$	25°C		150	400		150	400	mV
		Full range			700			700	
$I_{OL}$ Low-level output current	$V_{ID} = -1\text{ V},$ $V_{OL} = 1.5\text{ V}$	25°C		6	16		6	16	mA
$I_{CC}$ Supply current (four comparators)	$V_O = 2.5\text{ V},$ No load	25°C		0.8	2		0.8	2	mA

† All characteristics are measured with zero common-mode input voltage, unless otherwise specified.

‡ Full range (MIN to MAX) for LM139 and LM139A is  $-55^\circ\text{C}$  to  $125^\circ\text{C}$ . All characteristics are measured with zero common-mode input voltage, unless otherwise specified.

**switching characteristics,  $V_{CC} = 5\text{ V}, T_A = 25^\circ\text{C}$**

PARAMETER	TEST CONDITIONS	LM139 LM139A			UNIT	
		MIN	TYP	MAX		
Response time	$R_L$ connected to 5 V through 5.1 k $\Omega$ , $C_L = 15\text{ pF}$ §, See Note 5	100-mV input step with 5-mV overdrive			1.3	$\mu\text{s}$
		TTL-level input step			0.3	

§  $C_L$  includes probe and jig capacitance.

NOTE 5: The response time specified is the interval between the input step function and the instant when the output crosses 1.4 V.



**LM139, LM139A, LM239, LM239A,  
LM339, LM339A, LM2901**  
**QUAD DIFFERENTIAL COMPARATORS**  
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**electrical characteristics at specified free-air temperature,  $V_{CC} = 5\text{ V}$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS†	$T_A$ ‡	LM239 LM339			LM239A LM339A			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
$V_{IO}$ Input offset voltage	$V_{CC} = 5\text{ V to }30\text{ V}$ , $V_{IC} = V_{ICR(\text{min})}$ , $V_O = 1.4\text{ V}$	25°C		2	5		1	3	mV	
		Full range			9			4		
$I_{IO}$ Input offset current	$V_O = 1.4\text{ V}$	25°C		5	50		5	50	nA	
		Full range			150			150		
$I_{IB}$ Input bias current	$V_O = 1.4\text{ V}$	25°C		-25	-250		-25	-250	nA	
		Full range			-400			-400		
$V_{ICR}$ Common-mode input-voltage range		25°C		0 to $V_{CC}-1.5$			0 to $V_{CC}-1.5$		V	
		Full range		0 to $V_{CC}-2$			0 to $V_{CC}-2$			
$A_{VD}$ Large-signal differential-voltage amplification	$V_{CC} = 15\text{ V}$ , $V_O = 1.4\text{ V to }11.4\text{ V}$ , $R_L \geq 15\text{ k}\Omega\text{ to }V_{CC}$	25°C		50	200		50	200	V/mV	
$I_{OH}$ High-level output current	$V_{ID} = 1\text{ V}$	$V_{OH} = 5\text{ V}$	25°C		0.1	50		0.1	50	nA
		$V_{OH} = 30\text{ V}$	Full range			1			1	$\mu\text{A}$
$V_{OL}$ Low-level output voltage	$V_{ID} = -1\text{ V}$ , $I_{OL} = 4\text{ mA}$	25°C		150	400		150	400	mV	
		Full range			700			700		
$I_{OL}$ Low-level output current	$V_{ID} = -1\text{ V}$ , $V_{OL} = 1.5\text{ V}$	25°C		6	16		6	16	mA	
$I_{CC}$ Supply current (four comparators)	$V_O = 2.5\text{ V}$ , No load	25°C		0.8	2		0.8	2	mA	

† All characteristics are measured with zero common-mode input voltage, unless otherwise specified.

‡ Full range (MIN to MAX) for LM239 and LM239A is -25°C to 85°C, for LM339 and LM339A is 0°C to 70°C. All characteristics are measured with zero common-mode input voltage, unless otherwise specified.

**switching characteristics,  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$**

PARAMETER	TEST CONDITIONS	LM239, LM239A, LM339, LM339A			UNIT
		MIN	TYP	MAX	
Response time	$R_L$ connected to 5 V through 5.1 k $\Omega$ , $C_L = 15\text{ pF}$ §, See Note 5	100-mV input step with 5-mV overdrive			$\mu\text{s}$
		TTL-level input step			

§  $C_L$  includes probe and jig capacitance.

NOTE 5: The response time specified is the interval between the input step function and the instant when the output crosses 1.4 V.

**LM139, LM139A, LM239, LM239A,  
LM339, LM339A, LM2901  
QUAD DIFFERENTIAL COMPARATORS**

SLCS006F – OCTOBER 1979 – REVISED NOVEMBER 2001

**electrical characteristics at specified free-air temperature,  $V_{CC} = 5\text{ V}$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS†	$T_A$ ‡	LM2901			UNIT	
			MIN	TYP	MAX		
$V_{IO}$ Input offset voltage	$V_{CC} = 5\text{ V to }30\text{ V}$ , $V_{IC} = V_{ICR}(\text{min})$ , $V_O = 1.4\text{ V}$	25°C		2	7	mV	
		Full range			15		
$I_{IO}$ Input offset current	$V_O = 1.4\text{ V}$	25°C		5	50	nA	
		Full range			200		
$I_{IB}$ Input bias current	$V_O = 1.4\text{ V}$	25°C		-25	-250	nA	
		Full range			-500		
$V_{ICR}$ Common-mode input-voltage range		25°C		0 to $V_{CC}-1.5$		V	
		Full range		0 to $V_{CC}-2$			
$A_{VD}$ Large-signal differential-voltage amplification	$V_{CC} = 15\text{ V}$ , $V_O = 1.4\text{ V to }11.4\text{ V}$ , $R_L \geq 15\text{ k}\Omega\text{ to }V_{CC}$	25°C		25	100	V/mV	
$I_{OH}$ High-level output current	$V_{ID} = 1\text{ V}$	$V_{OH} = 5\text{ V}$	25°C		0.1	50	nA
		$V_{OH} = 30\text{ V}$	Full range			1	$\mu\text{A}$
$V_{OL}$ Low-level output voltage	$V_{ID} = -1\text{ V}$ , $I_{OL} = 4\text{ mA}$	25°C		150	500	mV	
		Full range			700		
$I_{OL}$ Low-level output current	$V_{ID} = -1\text{ V}$ , $V_{OL} = 1.5\text{ V}$	25°C		6	16	mA	
$I_{CC}$ Supply current (four comparators)	$V_O = 2.5\text{ V}$ , No load	25°C		0.8	2	mA	
	$V_{CC} = 30\text{ V}$ , $V_O = 2.5\text{ V}$ , No load			1	2.5		

† All characteristics are measured with zero common-mode input voltage, unless otherwise specified.

‡ Full range (MIN to MAX) for LM2901 is -40°C to 125°C. All characteristics are measured with zero common-mode input voltage, unless otherwise specified.

**switching characteristics,  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$**

PARAMETER	TEST CONDITIONS	LM2901			UNIT
		MIN	TYP	MAX	
Response time	$R_L$ connected to 5 V through 5.1 k $\Omega$ , $C_L = 15\text{ pF}$ §, See Note 5	100-mV input step with 5-mV overdrive			$\mu\text{s}$
		TTL-level input step			

§  $C_L$  includes probe and jig capacitance.

NOTE 5: The response time specified is the interval between the input step function and the instant when the output crosses 1.4 V.



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 | [APPLICATION NOTES](#) | [MORE LITERATURE](#) | [MODELS](#)

LM2901, Quad, General Purpose Differential Comparator  
 DEVICE STATUS: ACTIVE

PARAMETER NAME	<a href="#">LM139</a>	<a href="#">LM239</a>	LM2901	<a href="#">LM339</a>
IQ per channel (max) (mA)	0.5	0.5	0.625	0.5
Output Current (min) (mA)	6	6	6	6
tRESP Low - to - High (us)	0.3	0.3	0.3	0.3
Vs (max) (V)	36	30	30	30
Vs (min) (V)	2	2	2	2
VICR (max) (V)	3.5	3.5	3.5	3.5
VIO (25 deg C) (max) (mV)	5	5	3	5
Rail-Rail	No	No	No	No
Output Type	Open Drain/Collector	Open Drain/Collector	Open Drain/Collector	Open Drain/Collector
Number of Channels	4	4	4	4

#### FEATURES

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- Single Supply or Dual Supplies
- Wide Range of Supply Voltage ...2 V to 36 V
- Low Supply-Current Drain Independent of Supply Voltage . . . 0.8 mA Typ
- Low Input Bias Current . . . 25 nA Typ
- Low Input Offset Current ...3 nA Typ (LM139)
- Low Input Offset Voltage ...2 mV Typ
- Common-Mode Input Voltage Range Includes Ground
- Differential Input Voltage Range Equal to Maximum-Rated Supply Voltage . . .  $\pm 36$  V
- Low Output Saturation Voltage
- Output Compatible With TTL, MOS, and CMOS
- Package Options Include Plastic Small-Outline (D, NS), Shrink Small-Outline (DB), Thin Shrink Small-Outline (PW), and Ceramic Dual Flatpack (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) DIPs

#### DESCRIPTION

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These devices consist of four independent voltage comparators that are designed to operate from a single power supply over a wide range of voltages. Operation from dual supplies also is possible as long as the difference between the two supplies is 2 V to 36 V and  $V_{CC}$  is at least 1.5 V more positive than the input common-mode voltage. Current drain is independent of the supply voltage. The outputs can be connected to other open-collector outputs to achieve wired-AND relationships.

The LM139 and LM139A are characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The LM239 and LM239A are characterized for operation from  $-25^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The LM339 and LM339A are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ . The LM2901 is characterized for operation from  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ .

#### TECHNICAL DOCUMENTS

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To view the following documents, [Acrobat Reader 4.0](#) is required.

To download a document to your hard drive, right-click on the link and choose 'Save'.

#### DATASHEET

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Full datasheet in Acrobat PDF: [lm2901.pdf](#) (107 KB, Rev.F) (Updated: 11/14/2001)



APPLICATION NOTES

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- [Analog Applications Journal \(Rev. A\)](#) (SLYT010A - Updated: 03/17/2000)
- [Op Amps for Everyone Design Guide \(Rev. B\)](#) (SLOD006B - Updated: 08/22/2002)

MORE LITERATURE

[▲Back to Top](#)

- [Enhanced Plastic Portfolio Brochure](#) (SGZB004, 387 KB - Updated: 08/19/2002)
- [QML Class V Space Products Military Brief \(Rev. A\)](#) (SGZN001A, 257 KB - Updated: 10/07/2002)

SAMPLES

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ORDERABLE DEVICE	PACKAGE INDUSTRY (TI)	PINS	TEMP (°C)	STATUS	PRODUCT CONTENT	SAMPLES
LM2901D	<a href="#">SOIC (D)</a>	14	-40 TO 125	ACTIVE	<a href="#">View Product Content</a>	<a href="#">Request Samples</a>
LM2901N	<a href="#">PDIP (N)</a>	14	-40 TO 125	ACTIVE	<a href="#">View Product Content</a>	<a href="#">Request Samples</a>
LM2901PWR	<a href="#">TSSOP (PW)</a>	14	-40 TO 125	ACTIVE	<a href="#">View Product Content</a>	<a href="#">Request Samples</a>

PRICING/ AVAILABILITY/ PKG

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DEVICE INFORMATION  
Updated Daily

ORDERABLE DEVICE	STATUS	PACKAGE TYPE   PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY   \$US	STD PACK QTY
LM2901D	ACTIVE	<a href="#">SOIC (D)</a>   14	-40 TO 125	<a href="#">View Contents</a>	1KU   0.09	50
LM2901DR	ACTIVE	<a href="#">SOIC (D)</a>   14	-40 TO 125	<a href="#">View Contents</a>	1KU   0.09	2500
LM2901N	ACTIVE	<a href="#">PDIP (N)</a>   14	-40 TO 125	<a href="#">View Contents</a>	1KU   0.09	25

TI INVENTORY STATUS  
As Of 08:00 AM GMT, 17 Apr 2003

IN STOCK	IN PROGRESS QTY   DATE	LEAD TIME
<a href="#">4000*</a>	2100   21 Apr	2 WKS
	> 10k   12 May	
<a href="#">9000*</a>	4205   02 May	3 WKS
	2500   05 May	
	> 10k   08 May	
<a href="#">≥ 10k*</a>	8125   25 Apr	4 WKS
	> 10k   30 Apr	

REPORTED DISTRIBUTOR INVENTORY  
As Of 08:00 AM GMT, 17 Apr 2003

DISTRIBUTOR COMPANY   REGION	IN STOCK	PURCHASE
<a href="#">Avnet-SILICA</a>   Europe	> 1k	<a href="#">BUY NOW</a>
<a href="#">Arrow</a>   Americas	> 1k	<a href="#">BUY NOW</a>
<a href="#">Abacus Polar</a>   Europe	> 1k	<a href="#">BUY NOW</a>
<a href="#">EBV Electronik</a>   Europe	> 1k	<a href="#">BUY NOW</a>
<a href="#">Avnet</a>   Americas	> 1k	<a href="#">BUY NOW</a>
<a href="#">DigiKey</a>   Americas	> 1k	<a href="#">BUY NOW</a>
<a href="#">Newark Electronics</a>   Americas	692	<a href="#">BUY NOW</a>
<a href="#">Insight</a>   Americas	86	<a href="#">BUY NOW</a>
<a href="#">Abacus Polar</a>   Europe	> 1k	<a href="#">BUY NOW</a>
<a href="#">Arrow</a>   Americas	> 1k	<a href="#">BUY NOW</a>
<a href="#">Avnet</a>   Americas	> 1k	<a href="#">BUY NOW</a>
<a href="#">DigiKey</a>   Americas	> 1k	<a href="#">BUY NOW</a>
<a href="#">Avnet-SILICA</a>   Europe	> 1k	<a href="#">BUY NOW</a>
<a href="#">EBV Electronik</a>   Europe	> 1k	<a href="#">BUY NOW</a>

LM2901NSR	ACTIVE	<a href="#">SOP (NS)</a>   14		<a href="#">View Contents</a>	1KU   0.09	2000		0*	> 10k   08 May	4 WKS
LM2901PW	ACTIVE	<a href="#">TSSOP (PW)</a>   14	-40 TO 85	<a href="#">View Contents</a>	1KU   0.07	90		810*	990   16 Apr	4 WKS
									33   21 Apr	
									> 10k   08 May	
LM2901PWLE	OBSOLETE	<a href="#">TSSOP (PW)</a>   14		<a href="#">View Contents</a>	1KU			0*		Call**
LM2901PWR	ACTIVE	<a href="#">TSSOP (PW)</a>   14	-40 TO 125	<a href="#">View Contents</a>	1KU   0.09	2000		0*	> 10k   21 Apr	2 WKS
LM2901QD	OBSOLETE	<a href="#">SOIC (D)</a>   14	-40 TO 125	<a href="#">View Contents</a>	1KU			0*		Call**
LM2901QN	OBSOLETE	<a href="#">PDIP (N)</a>   14	-40 TO 125	<a href="#">View Contents</a>	1KU			0*		Call**


<a href="#">Arrow</a>   Americas	> 1k	<b>BUY NOW</b>
<a href="#">Avnet</a>   Americas	> 1k	<b>BUY NOW</b>
<a href="#">DigiKey</a>   Americas	> 1k	<b>BUY NOW</b>
<a href="#">Newark Electronics</a>   Americas	828	<b>BUY NOW</b>
<a href="#">Insight</a>   Americas	655	<b>BUY NOW</b>
None Reported <a href="#">View Distributors</a>		
None Reported <a href="#">View Distributors</a>		
None Reported <a href="#">View Distributors</a>		
<a href="#">Arrow</a>   Americas	> 1k	<b>BUY NOW</b>
<a href="#">Insight</a>   Americas	> 1k	<b>BUY NOW</b>
<a href="#">DigiKey</a>   Americas	851	<b>BUY NOW</b>
None Reported <a href="#">View Distributors</a>		
None Reported <a href="#">View Distributors</a>		

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- [LM2901 Spice Macromodel](#) (SLCJ010, 0 KB, ZIP - Updated: 01/10/2002)

Table Data Updated on: 4/17/2003

PRODUCT FOLDER | PRODUCT INFO: [FEATURES](#) | [DESCRIPTION](#) | [DATASHEETS](#) | [PRICING/AVAILABILITY/PKG](#) | [SAMPLES](#)  
[APPLICATION NOTES](#) | [MORE LITERATURE](#) | [MODELS](#)

### LM339, Quad, General Purpose Differential Comparator

DEVICE STATUS: ACTIVE

PARAMETER NAME	LM139	LM239	LM2901	LM339
IQ per channel (max) (mA)	0.5	0.5	0.625	0.5
Output Current (min) (mA)	6	6	6	6
tRESP Low - to - High (us)	0.3	0.3	0.3	0.3
Vs (max) (V)	36	30	30	30
Vs (min) (V)	2	2	2	2
VICR (max) (V)	3.5	3.5	3.5	3.5
VIO (25 deg C) (max) (mV)	5	5	3	5
Rail-Rail	No	No	No	No
Output Type	Open Drain/Collector	Open Drain/Collector	Open Drain/Collector	Open Drain/Collector
Number of Channels	4	4	4	4

#### FEATURES

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- Single Supply or Dual Supplies
- Wide Range of Supply Voltage ...2 V to 36 V
- Low Supply-Current Drain Independent of Supply Voltage . . . 0.8 mA Typ
- Low Input Bias Current . . . 25 nA Typ
- Low Input Offset Current ...3 nA Typ (LM139)
- Low Input Offset Voltage ...2 mV Typ
- Common-Mode Input Voltage Range Includes Ground
- Differential Input Voltage Range Equal to Maximum-Rated Supply Voltage . . .  $\pm 36$  V
- Low Output Saturation Voltage
- Output Compatible With TTL, MOS, and CMOS
- Package Options Include Plastic Small-Outline (D, NS), Shrink Small-Outline (DB), Thin Shrink Small-Outline (PW), and Ceramic Dual Flatpack (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) DIPs

#### DESCRIPTION

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These devices consist of four independent voltage comparators that are designed to operate from a single power supply over a wide range of voltages. Operation from dual supplies also is possible as long as the difference between the two supplies is 2 V to 36 V and  $V_{CC}$  is at least 1.5 V more positive than the input common-mode voltage. Current drain is independent of the supply voltage. The outputs can be connected to other open-collector outputs to achieve wired-AND relationships.

The LM139 and LM139A are characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The LM239 and LM239A are characterized for operation from  $-25^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The LM339 and LM339A are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ . The LM2901 is characterized for operation from  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ .

#### TECHNICAL DOCUMENTS

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To view the following documents, [Acrobat Reader 4.0](#) is required.

To download a document to your hard drive, right-click on the link and choose 'Save'.

#### DATASHEET

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Full datasheet in Acrobat PDF: [lm339.pdf](#) (107 KB,Rev.F) (Updated: 11/14/2001)

APPLICATION NOTES

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- [Analog Applications Journal \(Rev. A\)](#) (SLYT010A - Updated: 03/17/2000)
- [Op Amps for Everyone Design Guide \(Rev. B\)](#) (SLOD006B - Updated: 08/22/2002)

MORE LITERATURE

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- [Enhanced Plastic Portfolio Brochure](#) (SGZB004, 387 KB - Updated: 08/19/2002)
- [QML Class V Space Products Military Brief \(Rev. A\)](#) (SGZN001A, 257 KB - Updated: 10/07/2002)

SAMPLES

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ORDERABLE DEVICE	PACKAGE INDUSTRY (TI)	PINS	TEMP (°C)	STATUS	PRODUCT CONTENT	SAMPLES
LM339D	<a href="#">SOIC (D)</a>	14		ACTIVE	<a href="#">View Product Content</a>	<a href="#">Request Samples</a>
LM339DBR	<a href="#">SSOP (DB)</a>	14		ACTIVE	<a href="#">View Product Content</a>	<a href="#">Request Samples</a>
LM339N	<a href="#">PDIP (N)</a>	14		ACTIVE	<a href="#">View Product Content</a>	<a href="#">Request Samples</a>
LM339PWR	<a href="#">TSSOP (PW)</a>	14		ACTIVE	<a href="#">View Product Content</a>	<a href="#">Request Samples</a>

PRICING/ AVAILABILITY/ PKG

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DEVICE INFORMATION  
Updated Daily

TI INVENTORY STATUS  
As Of 08:00 AM GMT, 17 Apr 2003

REPORTED DISTRIBUTOR INVENTORY  
As Of 08:00 AM GMT, 17 Apr 2003

ORDERABLE DEVICE	STATUS	PACKAGE TYPE   PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY   \$US	STD PACK QTY	IN STOCK	IN PROGRESS QTY   DATE	LEAD TIME	DISTRIBUTOR COMPANY   REGION	IN STOCK	PURCHASE
LM339D	ACTIVE	<a href="#">SOIC (D)</a>   14		<a href="#">View Contents</a>	1KU   0.10	50	5080*	8560   25 Apr	2 WKS	<a href="#">Avnet-SILICA</a>   Europe	> 1k	<a href="#">BUY NOW</a>
								1600   30 Apr		<a href="#">Arrow</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Abacus Polar</a>   Europe	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Avnet</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">EBV Electronik</a>   Europe	> 1k	<a href="#">BUY NOW</a>
										<a href="#">DigiKey</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Newark Electronics</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Insight</a>   Americas	> 1k	<a href="#">BUY NOW</a>
LM339DBLE	OBSOLETE	<a href="#">SSOP (DB)</a>   14		<a href="#">View Contents</a>	1KU		0*		Call**	None Reported <a href="#">View Distributors</a>		
LM339DBR	ACTIVE	<a href="#">SSOP (DB)</a>   14		<a href="#">View Contents</a>	1KU   0.10	2000	0*	729   28 Apr	4 WKS	<a href="#">Insight</a>   Americas	> 1k	<a href="#">BUY NOW</a>
								1271   08 May		<a href="#">DigiKey</a>   Americas	> 1k	<a href="#">BUY NOW</a>
								> 10k   27 May				

Product Folder: LM339, Quad, General Purpose Differential Comparator

LM339DR	ACTIVE	<a href="#">SOIC (D)</a>   14	0 TO 70	<a href="#">View Contents</a>	1KU   0.10	2500	<u>0</u> *	> 10k   12 May	4 WKS	<a href="#">Avnet-SILICA</a>   Europe	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Arrow</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Insight</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">EBV Electronik</a>   Europe	> 1k	<a href="#">BUY NOW</a>
										<a href="#">DigiKey</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Newark Electronics</a>   Americas	> 1k	<a href="#">BUY NOW</a>
LM339N	ACTIVE	<a href="#">PDIP (N)</a>   14		<a href="#">View Contents</a>	1KU   0.10	25	<u>&gt; 10k</u> *	4000   28 Apr	4 WKS	<a href="#">Avnet-SILICA</a>   Europe	> 1k	<a href="#">BUY NOW</a>
								> 10k   30 Apr		<a href="#">Arrow</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Rochester Electronics</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">EBV Electronik</a>   Europe	> 1k	<a href="#">BUY NOW</a>
										<a href="#">DigiKey</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Avnet</a>   Americas	> 1k	<a href="#">BUY NOW</a>
										<a href="#">Newark Electronics</a>   Americas	> 1k	<a href="#">BUY NOW</a>
LM339NSLE	OBSOLETE	<a href="#">SOP (NS)</a>   14		<a href="#">View Contents</a>	1KU		<u>0</u> *		<a href="#">Call**</a>	<a href="#">Insight</a>   Americas	619	<a href="#">BUY NOW</a>
LM339NSR	ACTIVE	<a href="#">SOP (NS)</a>   14		<a href="#">View Contents</a>	1KU   0.10	2000	<u>0</u> *	1008   30 Apr	3 WKS	None Reported <a href="#">View Distributors</a>		
								> 10k   08 May		<a href="#">EBV Electronik</a>   Europe	> 1k	<a href="#">BUY NOW</a>
LM339PW	ACTIVE	<a href="#">TSSOP (PW)</a>   14		<a href="#">View Contents</a>	1KU   0.09	90	<u>0</u> *	90   16 Apr	4 WKS			
								> 10k   08 May		None Reported <a href="#">View Distributors</a>		
LM339PWLE	OBSOLETE	<a href="#">TSSOP (PW)</a>   14		<a href="#">View Contents</a>	1KU		<u>0</u> *		<a href="#">Call**</a>			
LM339PWR	ACTIVE	<a href="#">TSSOP (PW)</a>   14		<a href="#">View Contents</a>	1KU   0.10	2000	<u>&gt; 10k</u> *	> 10k   21 Apr	2 WKS	None Reported <a href="#">View Distributors</a>		
										<a href="#">Arrow</a>   Americas	> 1k	<a href="#">BUY NOW</a>
LM339Y	OBSOLETE	(Y)   14		<a href="#">View Contents</a>	1KU		<u>0</u> *		<a href="#">Call**</a>	<a href="#">Avnet-SILICA</a>   Europe	> 1k	<a href="#">BUY NOW</a>
										None Reported <a href="#">View Distributors</a>		

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- [LM339, LM339X2 Spice Macromodel](#) (SLCJ014, 0 KB, ZIP - Updated: 01/10/2002)

Table Data Updated on: 4/17/2003



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